

What is claimed is:

- 1) A computer-implemented forecasting system for determining time-phased sales forecasts and planned replenishment shipments for products that sell in low volumes in a retail store supply chain, the system comprising:
 - a) a forecasting system that determines projected sales of a plurality of low-volume products for a retail store in the supply chain during a first time period; and
 - b) a replenishment shipment system for distributing within said first time period shipment dates for each of said plurality of low-volume products using at least one of seasonal selling profile for each of said low-volume products during said first time period and randomization techniques.
- 2) A system according to claim 1, wherein said replenishment system generates a random number for each of said plurality of low-volume products.
- 3) A system according to claim 1, wherein said replenishment system determines different shipment dates within said first time period for low-volume products having more than one said projected sale during said first time period.
- 4) A system according to claim 2, wherein said replenishment system uses said random numbers to determine an offset from the first day of said first time period for each of said low-volume products that defines when each of said low-volume products is to be shipped.
- 5) A system according to claim 1, wherein said replenishment system adjusts said shipment dates for at least some of said plurality of low-volume products using both said seasonal profile and said randomization techniques.
- 6) A system according to claim 1, wherein said forecasting system determines projected sales for a plurality of low-volume products for a plurality of retail stores in the supply chain during said first time period.

- 7) A method of determining time-phased sales forecasts and planned replenishment shipments for products that sell in low volumes in a retail store supply chain, the method comprising the steps of:
 - a) determining projected sales of a plurality of low-volume products for a retail store in the supply chain during a first time period; and
 - b) distributing within said first time period shipment dates for each of said plurality of low-volume products using at least one of seasonal selling profile for each of said plurality of low-volume products during said first time period and randomization techniques.
- 8) A method according to claim 7, wherein said step b includes the step of adjusting said shipment dates for at least some of said plurality of low-volume products using both said seasonal selling profile and said randomization techniques.
- 9) A computer-implemented forecasting system for determining time-phased sales forecasts and planned replenishment shipments for products that sell in low volumes in a retail store supply chain, the system comprising:
 - a) forecasting means for determining projected sales of a plurality of low-volume products for a retail store in the supply chain during a first time period; and
 - b) replenishment shipment means for distributing within said first time period shipment dates for each of said plurality of low-volume products using at least one of seasonal selling profile for each of said plurality of low-volume products during said first time period and randomization techniques.
- 10) A system according to claim 9, wherein said replenishment means adjusts said shipment dates for at least some of said plurality of low-volume products using both said seasonal selling profile and said randomization techniques.
- 11) A computer-readable storage medium for storing a computer program comprising the steps of:

- a) determining projected sales of a plurality of low-volume products for a retail store in the supply chain during a first time period; and
- b) distributing within said first time period shipment dates for each of said plurality of low-volume products using at least one of seasonal selling profile for each of said plurality of low-volume products during said first time period and randomization techniques.

12) A medium according to claim 11, wherein said step b includes the step of adjusting said shipment dates for at least some of said plurality of low-volume products using both said seasonal selling profile and said randomization techniques.

13) A computer-implemented system for determining time-phased product sales forecasts and projected replenishment shipments for a retail store supply chain on a continuous basis using product sales history records generated by the retail stores, the system comprising:

- a) a forecasting system that determines projected sales of a plurality of products for a retail store in the supply chain using the product sales history records for said retail store, wherein said forecasting system re-forecasts said projected sales relative to at least some of said plurality of products immediately following occurrence of transactions for said at least some of said plurality of products that would invalidate said projected sales determination for said at least some of said plurality of products; and
- b) a replenishment system that determines projected replenishment shipments of products to said retail store from one or more first entities in the retail store supply chain using said projected sales determined by said forecasting system, wherein said replenishment system re-plans said projected replenishment shipments relative to at least some of said plurality of products immediately following occurrence of transactions for said at least some of said plurality of products that would invalidate said projected replenishment shipments for said at least some of said plurality of products.

14) A system according to claim 13, wherein said replenishment system determines projected replenishment shipments of products to said at least one first entity from one or more second

entities in the retail store supply chain using said projected replenishment shipments of products to said retail store, further wherein said replenishment system re-plans said projected replenishment shipments to said at least one first entity relative to at least some of said plurality of products immediately following the occurrence of a change of said projected replenishment shipments of products to said retail store for said at least some of said plurality of products that would invalidate said projected replenishment shipments from said at least one first entity.

15) A computer-implemented system for determining time-phased projected replenishment shipments for a first entity in a retail store supply chain on a continuous basis based on first projected replenishment shipments to retail stores in the supply chain to which the first entity provides products, the system comprising a replenishment system that determines second projected replenishment shipments of products to the first entity from one or more second entities in the retail store supply chain using the first projected shipments to the retail stores, wherein said replenishment system re-plans said projected replenishment shipments to the first entity relative to at least some of said plurality of products immediately following the occurrence of a change in the first projected shipments for said at least some of said plurality of products that would invalidate said second projected replenishment shipments for said at least some of said plurality of products.

16) A method of determining time-phased product sales forecasts and projected replenishment shipments for a retail store supply chain on a continuous basis using product sales history records generated by the retail stores, the method comprising the steps of:

- a) determining projected sales of a plurality of products for a retail store in the supply chain using the product sales history records for said retail store and re-forecasting said projected sales relative to at least some of said plurality of products immediately following occurrence of transactions for said at least some of said plurality of products that would invalidate said projected sales determination for said at least some of said plurality of products; and

- b) determining projected replenishment shipments of products to said retail store from one or more first entities in the retail store supply chain using said projected sales determined in said step a and re-planning said projected replenishment shipments relative to at least some of said plurality of products immediately following occurrence of transactions for said projected sales for said at least some of said plurality of products that would invalidate said projected replenishment shipments for said at least some of said plurality of products.

17) A computer-implemented system for determining time-phased product sales forecasts and projected replenishment shipments for a retail store supply chain on a continuous basis using product sales history records generated by the retail stores, the system comprising:

- a) forecast means for determining projected sales of a plurality of products for a retail store in the supply chain using the product sales history records for said retail store, wherein said forecasting means re-forecasts said projected sales relative to at least some of said plurality of products immediately following occurrence of transactions for said at least some of said plurality of products that would invalidate said projected sales determination for said at least some of said plurality of products; and
- b) replenishment means for determining projected replenishment shipments of products to said retail store from one or more first entities in the retail store supply chain using said projected sales determined by said forecasting means, wherein said replenishment means re-plans said projected replenishment shipments relative to at least some of said plurality of products immediately following occurrence of transactions for said projected sales for said at least some of said plurality of products that would invalidate said projected replenishment shipments for said at least some of said plurality of products.

18) A computer-readable storage media for storing a computer program for determining time-phased product sales forecasts and projected replenishment shipments for a retail store supply chain on a continuous basis using product sales history records generated by the retail stores in accordance with the steps of:

- a) determining projected sales of a plurality of products for a retail store in the supply chain using the product sales history records for said retail store and re-forecasting said projected sales relative to at least some of said plurality of products immediately following occurrence of transactions for said at least some of said plurality of products that would invalidate said projected sales determination for said at least some of said plurality of products; and
 - b) determining projected replenishment shipments of products to said retail store from one or more first entities in the retail store supply chain using said projected sales determined in said step a and re-planning said projected replenishment shipments relative to at least some of said plurality of products immediately following occurrence of transactions for said projected sales for said at least some of said plurality of products that would invalidate said projected replenishment shipments for said at least some of said plurality of products.
- 19) A computer-implemented replenishment shipment and transportation planning system for a plurality of products that sell in a retail store supply chain, the system comprising:
- a) a replenishment shipment system that determines planned shipment dates for a plurality of products to a retail store in the supply chain based on sales forecasts for said products; and
 - b) a transportation planning system that generates transportation plans for said plurality of products using said planned shipment dates determined by said replenishment system.
- 20) A system according to claim 16, wherein said planned shipment dates and said transportation plans are stored in a single database.
- 21) A system according to claim 16, wherein said transportation plans include weight of at least some of said plurality of products.
- 22) A system according to claim 16, wherein said transportation plans include cube for at least some of said plurality of products.

- 23) A system according to claim 16, wherein said transportation plans are determined at the same time as said planned shipment dates.
- 24) A system according to claim 16, wherein said planned shipment dates and said transportation plans are determined relative to a first plurality of products that is a subset of a second plurality of products that is larger than said first plurality of products in accordance with a first benchmark comprising determining (i) said planned shipment dates for one year in the future in a first time period and (ii) said transportation plans for one year in the future in a second time period, when said first plurality of products is 15,000 in number, said second plurality of products is 50,000 in number, the product sales history records are 715,000 in number, there is a net change for only said first plurality of products, and said projected sales and said first projected replenishment shipments are determined using a computer capable of executing, in either of said first time period and said second time period, no more than an equivalent number of instructions to what can be executed by a computer having two X86 instruction set microprocessors, one gigabit of transient memory and at no more than an average of 60% utilization of said two microprocessors, in either of said first time period and said second time period, wherein said first time period and second time period are each less than 20 minutes.
- 25) A system according to claim 16, further including a capacity planning system that generates capacity plans for said plurality of products using said planned shipment dates determined by said replenishment system.
- 26) A system according to claim 16, further including a forecasting system for determining said sales forecasts for said plurality of products.
- 27) A computer-implemented replenishment shipment and capacity planning system for a plurality of products that sell in a retail store supply chain, the system comprising:

- a) a replenishment shipment system that determines planned shipment dates for a plurality of products to a retail store in the supply chain based on sales forecasts for said products; and
- b) a capacity planning system that generates capacity plans for said plurality of products using said planned shipment dates determined by said replenishment system.

28) A system according to claim 24, wherein said planned shipment dates and said capacity plans are stored in a single database.

29) A system according to claim 24, wherein said capacity plans include picking hours for at least some of said plurality of products.

30) A system according to claim 24, wherein said capacity plans include receiving hours for at least some of said plurality of products.

31) A system according to claim 24, wherein said capacity plans include at least one of packaging, repackaging, cleaning and sorting requirements for at least some of said plurality of products.

32) A system according to claim 24, wherein said capacity plans are determined at the same time as said planned shipment dates.

33) A system according to claim 24, wherein said planned shipment dates and said capacity plans are determined relative to a first plurality of products that is a subset of a second plurality of products that is larger than said first plurality of products in accordance with a first benchmark comprising determining (i) said planned shipment dates for one year in the future in a first time period and (ii) said transportation plans for one year in the future in a second time period, when said first plurality of products is 15,000 in number, said second plurality of products is 50,000 in number, the product sales history records are 715,000 in number, there is a net change for only said first plurality of products, and said projected sales and said first

projected replenishment shipments are determined using a computer capable of executing, in either of said first time period and said second time period, no more than an equivalent number of instructions to what can be executed by a computer having two X86 instruction set microprocessors, one gigabit of transient memory and at no more than an average of 60% utilization of said two microprocessors, in either of said first time period and said second time period, wherein said first time period and second time period are each less than 20 minutes.

- 34) A system according to claim 24, further including a forecasting system for determining said sales forecasts for said plurality of products.
- 35) A computer-implemented replenishment shipment and transportation planning system for a plurality of products that sell in a retail store supply chain, the system comprising:
- a) replenishment means for determining planned shipment dates for a plurality of products to a retail store in the supply chain based on sales forecasts for said products; and
 - b) transportation means for generating transportation plans for said plurality of products using said planned shipment dates determined by said replenishment system.
- 36) A method of determining replenishment shipments and transportation plans for a plurality of products that sell in a retail store supply chain comprising the steps of:
- a) determining planned shipment dates for a plurality of products to a retail store in the supply chain based on sales forecasts for said products; and
 - b) generating transportation plans for said plurality of products using said planned shipment dates determined by said replenishment system.
- 37) A computer-readable storage medium for storing a computer program for determining replenishment shipments and transportation plans for a plurality of products that sell in a retail store supply chain comprising the steps of:
- a) determining planned shipment dates for a plurality of products to a retail store in the supply chain based on sales forecasts for said products; and

- b) generating transportation plans for said plurality of products using said planned shipment dates determined by said replenishment system.

38) A computer-implemented replenishment shipment and capacity planning system for a plurality of products that sell in a retail store supply chain, the system comprising:

- a) replenishment means for determining planned shipment dates for a plurality of products to a retail store in the supply chain based on sales forecasts for said products; and
- b) capacity means for generating capacity plans for said plurality of products using said planned shipment dates determined by said replenishment system.

39) A method of determining replenishment shipments and capacity plans for a plurality of products that sell in a retail store supply chain comprising the steps of:

- a) determining planned shipment dates for a plurality of products to a retail store in the supply chain based on sales forecasts for said products; and
- b) generating capacity plans for said plurality of products using said planned shipment dates determined by said replenishment system.

40) A computer-readable storage medium for storing a computer program for determining replenishment shipments and capacity plans for a plurality of products that sell in a retail store supply chain comprising the steps of:

- a) determining planned shipment dates for a plurality of products to a retail store in the supply chain based on sales forecasts for said products; and
- b) generating capacity plans for said plurality of products using said planned shipment dates determined by said replenishment system.